



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

SOMETHING ABOUT SEEDS.*

BY W. W. BAILEY.

By simply calling attention to the many beauties of these little organs, I hope to induce the youthful student to follow further in that pleasant path which I shall merely indicate.

A few months since I was reading with a tear in one eye for the misfortunes of the French, and a twinkle of merriment in the other, at the adventures of their ubiquitous war minister, when my breath disturbed the seed of an *Asclepias* (*A. incarnata*), by accident reposing on my table, and it floated on a voyage of discovery to a distant corner of my room. "Monsieur Gambetta!" I exclaimed, "Here is your original *aéronaut*! No balloon or parachute of man's invention can compare with the tufted silk which floats this little voyager! Fearlessly he trusts himself to the breezes, now for a moment touching on some interposing obstacle, then lightly sailing off again to bear his freight of life to the position chosen for its home."

And now the flossy seedkin has come into our lines, and shall not be released until he passes a satisfactory examination. Where are you travelling, little stranger, and what is the cause of your hurry? Can you not tell us something of your balloon itself, and of your purpose in trusting to the winds? After an ineffectual effort to soar beyond my reach, the imprisoned seed reveals his secret, and in so far as I can interpret his peculiar language, his story is as follows:—

The seed of *Asclepias*, or milkweed, is thin, flat, and of a brownish tint. The embryo is devoid of that store of albumen which many plants provide for the early sustenance of their young. It, with its fellows, is imbricated upon a papery placenta, its plummy tufts reposing in gill-like processes of the same until the perfection of the fruit, when they become disengaged by the lightest touch, and waft the attached seed to its destined resting-place. Nothing can be more soft and satiny than is the so-called coma of *Asclepias*. Under the microscope the hairs are found to be exceedingly smooth and regular in outline, and undistinguished

* A paper read before the Franklin Society, of Providence, R. I.

by the spiral twisting which characterizes many similar fibres. The evident design of the plumes, as in other cases where seeds are provided with such appendages, is to assist in the wide-spread distribution of the species. Many seeds probably fall quite near the parent plant, but chance breezes carry others often to a very great distance.

Some one is already wondering, doubtless, why I have not taken the more familiar dandelion for illustration. It is simply because, as I have said, the *Asclepias* happened to be upon my table. As every one knows, the dandelion (*Taraxacum*), the groundsel (*Sencio*), the thistle (*Cirsium* and *Onopordon*), and many other genera of *Compositæ*, the willows (*Salicaceæ*), some of the buttercups (*Ranunculaceæ*), the evening primrose family (*Onagraceæ*), together with members of many other orders, are similarly endowed with silky tufts to assist the seed in its migrations. The execution may differ in diverse species, but the plan remains the same. This is the commonest, yet other methods are adopted to obtain the same end, as we notice in the key-like samara of the maple and the winged seeds of the trumpet creeper (*Tecoma radicans*), of the pines and the elms. All these are charming objects viewed by the unassisted eye, or more closely examined by means of the microscope.

I cannot dismiss this portion of my subject without dwelling for a few moments upon the means provided for the scattering of seeds. Some plants, like the balsam (*Impatiens*) and the geranium, by a sudden contraction of portions of the capsule, expel the contents with a jerk, which often throws them to a considerable distance. Others are provided with little hooks, claws, fine hairs, or some other mechanical means of attaching themselves to moving objects and availing themselves of their involuntary aid. There is no American botanist, probably, but has expostulated mildly with the chain-like pods of *Desmodium*, which will persist in adhering to one's clothing, and the removal of which is no small task. The barbed achenium of *Bidens frondosa* is another pest to man, as are the burs of *Lappa major*, or burdock, to sheep and cattle, but we must bear in mind that in the case of these plants, we are merely mediums of conveyance, and have temporarily resigned our proud position at the head of nature.

Animals and birds often distribute seeds which have passed through the system undigested; currents of water in the ocean

bear them from one island or continent to another, while commerce, often unintentionally, scatters them over distant lands. In this latter way, many of the most pernicious weeds have spread from Europe into Australia, America and India, where they make themselves perfectly at home, and evince frequently even more vitality than the native plants. To take one or two instances of this peculiar method of spreading, the *Rudbeckia hirta* is said to have come into New England with hay seed from the West, and is evidently increasing, while in New Brunswick I have heard it claimed that the white-weed (*Leucanthemum vulgare*) has spread with other Yankee notions from the neighboring states. It has certainly proved a successful invader and has taken possession of half the cultivated country.

I cannot refrain from inserting here a note from Sir J. E. Tenent's "Ceylon" in relation to the curious seeds of *Spinifex squarrosus*, the "water-pink" as it is sometimes called by Europeans.

"The seeds of this plant are contained in a circular head, composed of a series of spine-like divisions, which radiate from the stalk in all directions, making the diameter of the whole about eight or nine inches. When the seeds are mature, and ready for dispersion, these heads become detached from the plant, and are carried by the wind with great velocity along the sands, over the surface of which they are impelled by their elastic spines. One of these balls may be followed by the eye for miles as it hurries along the level shore, dropping its seeds as it rolls, which speedily germinate and strike root where they fall. The globular heads are so buoyant as to float lightly on the water, and the uppermost spines acting as sails, they are thus carried across narrow estuaries to continue the process of embanking on newly formed sand-bars. Such an organization irresistibly suggests the wonderful means ordained by Providence to spread this valuable plant along the barren beach to which no seed-devouring bird ever resorts; and even the unobservant natives, struck by its singular utility in resisting the encroachments of the sea, have recorded their admiration by conferring on it the name of Maha-Rawana-raewula, 'the great beard of Rawana or Rama.'"

As to the duration of seeds there are many conflicting accounts. All are familiar with the old story of the grain found with Egyptian mummies, which vegetated after its disinterment and gave rise to a peculiar kind of wheat. This was a pleasant tale with which to point a moral, but it is now discredited by those most familiar with the facts. Still, it holds its place in many popular books, and shows the ease with which incorrect statements may

gain credence, and with what difficulty they are refuted when once proclaimed. That some seeds do live for a long time cannot be doubted, but no such extreme limit is authenticated as that cited for the mummy wheat. There are too many opportunities for error and even fraud, where a story is received at second hand from the Arabs. The largest of the accepted statements look a mite apocryphal. With most seeds the principle of life is evanescent, and it is with extreme difficulty that many can be transported from one climate or country to another. Even those that preserve their appearance unchanged and remain suitable for food, are often found to have lost their power of germination. It is claimed, and probably with truth, that when the thorn-apple (*Datura stramonium*) springs up in a place where it has not been seen before for many years, or even during the life-time of the observer, that the seeds have been lying dormant in the soil until some favorable condition has caused them to vegetate. So also when weeds, hitherto unknown in the vicinity, spring up along the embankments of a newly opened railway, or upon the ruins of extensive conflagrations. But these are only exceptions to the general rule, that to insure the vegetation of seed, it is necessary to plant it within a limited space of time, and that the preservation of it indefinitely is hazardous. The conditions necessary for the retention of vitality are not as yet certainly known, but it is thought that a particular amount of dryness, together with the exclusion of light and air, are essentials to success.

The total amount of seed produced by some plants is very remarkable. Linnæus says that a single stem of tobacco yields forty thousand seeds, and we all know how well provided with them are our commonest plants. It follows, then, that while, may be, a portion remain as I have said, dormant for a certain time, yet many are destroyed by unfavorable conditions, or as food for animals and man. We are thus reminded of the suggestive lines of Holmes :

“Look at the wasted seeds that Autumn scatters,
The myriad germs that Nature shapes and shatters.”

I have already spoken of the dissemination of seeds and the means by which it is effected. We will now examine with the microscope the seeds themselves. Those of *Stellaria* are always pretty objects, as are likewise those of the clove pink (*Dianthus caryophyllus*) and other genera of Caryophyllaceæ. The seed of

Collomia linearis is a very remarkable object. It is, in its normal condition, dry and hard, but when moistened and placed beneath the microscope, we are astonished to find it covered with myriads of little threads, which project into the water, and keep it in constant motion. These are spiral fibres, which when dry, remain closely attached to the surface of the seed. The seed of *Geranium* appears as if enclosed in a net, that of *Hypericum* is crested upon one side, and is aptly compared by Lindley to an ancient helmet, while the tiny black fruit of *Polygala* is covered with white hairs, and is provided with a curious appendage called a caruncle. This seems to be composed of light cellular tissue, which, when magnified, owing to its beautiful whiteness and the distinct demarcation of its cells, resembles frost-work ; or to the chemist, suggests more strikingly the appearance of a glass rod which has been heated, and suddenly cooled by immersion in water. *Corydalis* is furnished with an aril, or accessory appendage, as is also the *Euonymus*, and many other plants. The aril in *Euonymus*, is red, and is one cause of the extreme beauty of this plant in autumn, when its colored pods expand and reveal the deeper tinted coating of the seed within.

With the beautiful colors often assumed by seeds, all are of course acquainted who in childhood have arrayed the gayly tinted beans in military order. Nearly all the primary colors are brought into play to ornament the different seeds, while some, more regal in their fancies, are bedecked with bronze and gold. The mention of beans, suggests the use of seed to man, the *Gramineæ* and *Leguminosæ* furnishing a very large proportion of our food. Then, too, when we think that all our fruits have a direct relation to the seeds, we must feel how absolutely dependent we are upon these unborn plantlets for our sustenance and comfort.

Yet there are many seeds that are not edible, and others that are extremely noxious. The most deadly substance known, perhaps, is prepared from the seed of *Strychnos nux-vomica*. From this fact alone, and the knowledge that even here destructive seeds surround us, we learn that the study we have been engaged in, is not a profitless occupation. It teaches us, not only the hidden beauties that encompass us, but how to discriminate between the hurtful and the beneficial fruits — the worthless and the advantageous.